

REMARKS

In response to the Office Action dated October 3, 2005, Applicants respectfully request reconsideration based on the following remarks. Applicants respectfully submit that the claims as presented are in condition for allowance.

Claims 1-3 and 5-14 were rejected under 35 U.S.C. § 103 as being unpatentable over Hudgins in view of Giboney. This rejection is traversed for the following reasons.

Claim 1 recites "a heat spreader having a first and second surface, the first surface in thermal contact with the electronic chip set and adapted to provide unimpeded heat flow, and the second surface in thermal contact with the optoelectronic transducer, the first surface being orthogonal to the second surface." In the exemplary embodiment shown in Applicants' Figure 1, the chips 110 and the optoelectronic transducer 160 are positioned on different, orthogonal sides of head spreader 200.

This feature is not taught by Hudgins. In Hudgins, the chips 46 and the optoelectronic package 60 are positioned on the same side of the cooling core 50. The Examiner has creatively reasoned that element 70 in Hudgins is part of the optoelectronic transducer to find the claimed orthogonal relationship in Hudgins. Applicants disagree that element 70 in Hudgins is part of the optoelectronic transducer. Item 70 in Hudgins is referenced as an electrically conductive extension member. Hudgins teaches that extension member 70 "could include another part of the substrate that includes an electrical conduction path, such as formed by techniques known to those skilled in the art, such as copper or other electrical traces." Thus, extension member 70 is described more as a substrate than as part of optical transducer 60. Furthermore, claim 3 of Hudgins clearly describes the extension member 70 as an additional component beyond the optical transducer. Claim 3 describes an optical interconnect module "further comprising" a circuit carrying extensions. The language "further comprising" means that the recited element is an additional element to those recited in the previous claim. Thus, the extension member 70 cannot be considered a part of the optoelectronic transducer 60 as proposed by the Examiner.

Giboney was relied on for disclosing an optical coupling guide, but fails to cure the deficiencies of Hudgins discussed above.

For at least the above reasons, claim 1 is patentable over Hudgins in view of Giboney. Claims 3, 5-10 and 12-14 variously depend from claim 1 and are patentable over Hudgins in view of Giboney for at least the reasons advance with reference to claim 1.

Furthermore, with respect to claims 8-10, the Examiner reasons that the placement of the flexible circuit board is an obvious rearranging of parts to make the device more compact involving routine skill in the art. Applicants respectfully disagree. The ability to connect the flexible printed circuit board to, for example, the edge surface of the substrate, allows the heat spreader to having more direct contact with the electronic chip set and the optoelectronic transducer. This is not a routine design choice, but rather a deliberate design objective that improves cooling efficiency of the electronic chip set and the optoelectronic transducer. Thus, claims 8-10 are patentable over Hudgins in view of Giboney.

Claim 11 has been placed in independent form. Claim 11 recites a chip set, a substrate and a printed circuit board. In the exemplary embodiment shown in Applicants' Figure 1, chip 110, substrate 120 and printed circuit board 180 are shown. Claim 11 recites "wherein the flexible printed circuit board is absent electrical signal interconnections except for electrical signal interconnections between the substrate and the optoelectronic transducer." In Hudgins, the flexible circuit 101 provides a connection between the optoelectronic module 60 and the printed circuit board 30b. Hudgins does not teach all three of a chip set, a substrate and a printed circuit board as recited in claim 11. Hudgins teaches a chip set 46 on a circuit board 30b. There is no substrate. The Examiner considers element 30b the substrate. Under this interpretation, Hudgins fails to teach a printed circuit board. Under any interpretation, Hudgins only teaches one of the substrate or printed circuit board. This is contrary to claim 11. Hudgins does not teach a chip, substrate and printed circuit board along with the connection by the flexible printed circuit board in claim 11.

For at least the above reasons, claim 11 is patentable over Hudgins in view of Giboney.

Claim 4 was rejected under 35 U.S.C. § 103 as being unpatentable over Hudgins in view of Giboney and Nakao. Nakao was relied upon for disclosing ceramic material for the substrate, but fails to cure the deficiencies of Hudgins and Giboney discussed above. Claim 4 depends from claim 1 and is patentable over Hudgins in view of Giboney and Nakao for at least the reasons advance with reference to claim 1.

In view of the foregoing remarks and amendments, Applicants submit that the above-identified application is now in condition for allowance. Early notification to this effect is respectfully requested.

If there are any charges with respect to this response or otherwise, please charge them to Deposit Account 09-0463.

Respectfully submitted,

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Date: December 14, 2005

POUS9920030015U81
IB1-0054